Confidential Claim Retracted

AUTHORIZED BY: [signature]

DATE: 5/16/13

JACKPILE MINE PROJECT LAGUNA, NM

PROJECT STATUS REPORT NO. 5

DEC. 31, 1989

9404035

Bradbury & Stamm Construction Company, Inc.

1217 First Street NW, PO Box 25027, Albuquerque, NM 87125-0027 • (505) 765-1200

BRADBURY & STAMM CONSTRUCTION COMPANY, INC.

PROJECT NO. 4589

J A C K P I L E M I N E P R O J E C T

LAGUNA, NEW MEXICO

P R O J E C T S T A T U S R E P O R T

N O . 5

P E R I O D E N D I N G D E C E M B E R 3 1 , 1 9 8 9

BRADBURY & STAMM CONSTRUCTION COMPANY, INC.

BY: _____

Harold V. Larkin Jr.
Senior Project Manager

cc: Jim Olsen - Pueblo of Laguna
Neal Kasper - Laguna Construction Company
Bradbury & Stamm

JACKPILE MINE RECLAMATION

MONTHLY STATUS REPORT

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1. PROGRESS REPORT AND COMPLETION SCHEDULE

1.1 Progress Report

* The contract with the Interim Construction Management Contractor was signed by the Pueblo of Laguna on July 31, 1989.

* Work on the Shop area is 100% complete.

* The two pumps for dewatering the North Paguate were delivered on August 15, 1989.

* The first grader was delivered on August 16, 1989 and started grading the roads immediately.

* The first load of pipe for the dewatering was delivered on August 17, 1989. The last load of pipe was delivered on August 29, 1989.

* Electric power was restored to the shop area on August 25, 1989.

* The CMC office was set up at the shop area on August 31, 1989.

* Keers finished reinsulating the shop on September 1, 1989.

* The survey crew started staking the evaporation ponds on September 6, 1989 and work started on them in the afternoon.

* The overhead crane in the shop was reactivated on September 7, 1989.

* Boring the pipeline under highway 279 started on September 11, 1989 and finished on September 14th.

* The first set of water samples from the North Paguate pit were taken on September 10, 1989.

* The pumps were floated in the North Paguate pit on September 20, 1989 and started up on September 22nd.

* Demolition in the old housing area started on September 25, 1989.

* Grand opening ceremonies were held on September 30, 1989.

1. PROGRESS REPORT AND COMPLETION SCHEDULE

1.1 Progress Report

* Demolition in the P-10 area started on October 10, 1989

* 19,586,000 gallons of water had been pumped by October 24, 1989

* Drilling of the ground water monitoring wells started on October 25, 1989

* The sewer lagoons at the P-10 area were completely filled in on October 26, 1989

* The Environmental Monitoring Plan was approved on October 19, 1989

* The first semi-annual aerial photograph was delivered on October 20, 1989

* Ground water monitoring wells were completed on November 7, 1989.

* Continental Divide started removing the electric poles and cable on November 8, 1989.

* Work started on the first production work package, NP-OP-19, on November 8, 1989.

* Started filling the air vents on November 13, 1989

* Baseline surface water samples were taken on November 14, 1989.

* The H-1 adit use sealed on November 21, 1989.

* Scraper work on NP-PS-13 started on November 27,1989.

* NP-OP-19 was completed the 1st of December.

* Plugging of the air vents was completed in December.

* Operator training started December 5th.

* Well #8 was redrilled December 11-12th.

* The radiation survey of NP-OP-19 and the old housing area was done December 20-21st.

HEALTH PHYSICS PROCEDURES MANUAL

Procedure 1.0

Sampling for Airborne Radioactive Particulates

Approved:

_____ Date:_____

_____ Date:_____

1.0 PURPOSE

The purpose of this procedure is to describe a step by step method of sampling airborne radioactive particulates as general area samples. Air particulate sampling is necessary to demonstrate compliance with the requirements of 10 CFR 20, to determine when routine or nonroutine bioassay procedures are required, and to ensure that exposures are being maintained ALARA.

2.0 SCOPE

This procedure explains how to collect general area samples. A simple means of correcting the volume of air sampled to 25 degrees C and one atmosphere is provided.

3.0 REFERENCES

3.1 NIOSH MANUAL OF ANALYTICAL METHODS, Third Edition, U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health, 1987

3.2 10 CFR 20, Appendix B.

3.3 Jack Pile Project Radiation Protection Manual

4.0 EQUIPMENT AND MATERIALS

4.1 SKC personnel sampling pump and 6 volt dc power source (or equivalent. Six or seven pumps are recommended

4.2 37mm diameter filter three piece cassettes loaded with preweighed polyvinyl chloride filters having a 5.0 micrometer poresize.

4.3 Reinforced butyl rubber fuel line tubing or equivalent.

4.4 Air pump calibrator.

5.0 SAMPLING PROCEDURE

5.1 Attach a representative filter cassette to the pump. Calibrate the air pump according to the instructions provided in the calibration procedure.

5.2 Set the flow rate as accurately as possible (± 5%) to the desired flow rate (about 4 to 4.5 liters/minute.

5.3 Remove the representative filter cassette from the air pump.

5.4 Obtain a preweighed loaded filter cassette. Remove any filter cassette plugs or end-cap. Attach the filter cassette to the sampling pump. The air being sampled should not pass through any hose or tubing before entering the filter. For a general area sample, place the open faced filter cassette at a height of about 3 feet above the ground or floor.

5.5 Observe the sampler frequently. At the first evidence of excessive filter loading or change in pump flow rate, measure the flow rate and then remove the filter cassette. Repeat steps 5.1 through 5.4.

5.6 Cap and plug the used filter cassette. Label the sample. Record all of the pertinent sampling data including times of beginning and end of sampling, flow rates, rotameter readings, the altitude and average temperature.

5.7 If the flow rates were determined with the bubble meter, determine the corrected volume of air sampled using Equation 1 and the correction factors provided in Table 1.1.

(Equation 1)

Volume = (Flow Rate)(Sample Time)(Factor)

In Equation 1, "Factor" is the temperature-altitude correction factor that can be read directly from Table 1; "Sample Time" is the number of minutes that the sample was collected for, and "Flow Rate" is the air flow rate in liters per minute that was measured with the bubble meter.

5.8 If the flow rates were measured with a mass flow meter, determine the corrected volume of air sampled using Equation 2.

(Equation 2)

Volume = (Flow Rate)(Sample Time)

In Equation 2, "Sample Time" is the number of minutes that the sample was collected for, and "Flow Rate" is the air flow rate in liters per minute that was measured with the mass flow meter.

5.9 Complete the Airborne Radioactive Particulate Sample Form 1.1 for each sample.

5.10 Complete a Quarterly Air Sampling Station Summary Form 1.2. for each station. Complete the instructions to the laboratory in Part II of Form 1.2 by marking the appropriate blanks. At the end of the sampling period, forward a copy of Form 1.2 to the laboratory along with the sample cassettes from that sampling station.

Table 1.1 Temperature–Altitude correction factors for bubble calibrations only, to be used in Equation 1.

Altitude Ft.	Calibration and average sampling temperature				
	-20°C - 4°F	-5°C 23°F	10°C 50°F	25°C 77°F	40°C 104°F
0	1.18	1.11	1.05	1.00	.952
1000	1.13	1.07	1.01	.966	.921
2000	1.08	1.03	0.978	.933	.891
3000	1.04	0.990	0.941	.901	.862
4000	0.999	0.952	0.909	.870	.834
5000	0.959	0.916	0.876	.840	.806
6000	0.921	0.881	0.845	.811	.780
7000	0.883	0.847	0.813	.783	.754
8000	0.848	0.815	0.785	.756	.730

Form 1.1

AIRBORNE RADIOACTIVE PARTICULATE SAMPLE LOG

Site Name_____ Station Number_____

Date_____ Sample Number_____

Filter Media_____ Technician_____

Pump Model_____ Serial Number_____ Average Temperature_____

Start Time_____ Sample End Time_____ Sample Duration_____

Calibrator Type_____ Serial Number_____

Elevation (Ft)_____ Temp/Elevation Correction_____

Rotameter Reading: Initial_____ Final_____

Measured Flow Rate: Initial_____ Final_____ Average_____

Corrected Sample Volume (L)_____

Location_____

Comments/Observations_____

Form 1.2

QUARTERLY AIR SAMPLING STATION SUMMARY

Part I

Sample Station_____ Total Corrected Volume (L)_____

Start Date_____ Stop Date_____

Sample Number	Corrected Volume (L)	Sample Number	Corrected Volume (L)

Part II

Analyze Individually for: Gross Alpha_____ Other_____

Analyze as Composite for: TSP_____ Total U_____ Th-230_____ Ra-226_____

Po-210_____ Pb-210_____

Procedure 2.0

Collection of Water Samples

Approved:

_____ Date:_____

_____ Date:_____

1.0 PURPOSE

The purpose of this procedure is to describe a step by step method of collecting water samples for radiochemical analysis. Water sampling is an integral part of the Jackpile Project environmental monitoring program.

2.0 SCOPE

This procedure explains how to collect water samples for radiochemical analysis.

3.0 REFERENCES

3.1 10 CFR 20, Appendix B.

3.2 Jack Pile Project Radiation Protection Manual

4.0 EQUIPMENT AND MATERIALS

4.1 New 1 gallon cubitainers.

4.2 Water sampling device: teflon monitoring well bailer, or other appropriate sampler.

4.3 Decontamination facility .

4.4 0.45 um membrane filter.

4.5 Filtering funnels and apparatus.

4.6 Concentrated nitric acid (70%).

5.0 SAMPLING PROCEDURE

5.1 Transfer approximately 1 gallon of water sample into a new cubitainer from the sample collection device.

5.2 Seal the sample. Label the cubitainer with the location, date, sample number and analytes to be determined. Complete any chain of custody documentation required by the project quality assurance plan.

5.3 Dispose of the sample collection device if it is disposable. Reuseable sample collection devices shall be submitted to the decontamination facility for decontamination prior to reuse. Sampling device cleaning steps that are suitable for the the nonradioactive parameters should also be sufficient for the radioactive constituents.

5.4 Include at least one rinseate water sample from the final rinse of the reuseable sampling device with each batch of samples. The rinseate sample should handled and labeled in the same manner as the water samples. Specify that the rinseate sample be analyzed for the same parameters as the regular samples.

5.5 As a field blank, include a one gallon sample from the water supply that is the source of the water used for decontamination. The field blank should handled and labeled in the same manner as the regular water samples. Specify that the field blank be analyzed for the same parameters as the regular samples.

5.6 Specify whether the samples are to be analyzed for radioactive components on a total sample basis or dissolved activity basis. If not specified, the samples will be analyzed on a total sample basis.

5.7 Samples analyzed for dissolved activity should be filtered through a 0.45 micrometer filter and then acidified with concentrated nitric acid to a pH of less than 2. About 10 ml of concentrated nitric acid per gallon may may be per gallon is often sufficient to preserve the sample. Filtered and preserved samples should be marked as such.

> Workers are not to handle concentrated nitric acid without proper safety equipment. Contents of the material safety data sheet for nitric acid must be explained to water sampling personnel before they use it.

5.8 Samples can be shipped to the radiochemical laboratory via common carrier if packed, labeled, marked, and manifested in accordance with applicable DOT hazardous materials regulations.

5.9 Samples must be safely and securely packed if transported to the radiochemical laboratory via private vehicle.

5.10 Form 2.1 will accompany each sample batch to the radiochemical laboratory.

TMA / Eberline

FIELD SAMPLE COLLECTION FORM

Form 2.1

SITE NUMBER ______ SITE NAME ______ ACTIVITY SUPPORT ______

SAMPLE IDENTIFICATION	TYPE (1)	ON-SITE GRID POINTS (2)		SURF ELEV. (3)	DATE COLL.	DEPTH (CM) ☐ (FT) ☐	PURP. (4)	ANALYSES REQUIRED (5)	SAMPLING NOTES AND W.O. NUMBER
		X-GRID POINT	Y-GRID POINT						

(1) SAMPLE TYPE

SURFACE SOIL	SS
BIAS SOIL	BS
PROFILE SOIL	PS
SEDIMENT SILT	SD
SLUDGE	SL
VEGETATION	VE
GROUND WATER	GW
SURFACE WATER	SW
OTHER	OR

(2) GRID POINTS

+X = EAST
-X = WEST
+Y = NORTH
-Y = SOUTH

(3) SURFACE ELEVATION

(4) PURPOSE

RAD. CHARACT.	RC
VERIFICATION	VR
QUALITY CONTROL	QC
HOT SPOT	HS
RESAMPLE	RS
BACKGROUND	BG
ROUTINE	RT
SPECIAL	SP

(5) ANALYSES REQUIRED

TOTAL URANIUM	U
ISOTOPIC URANIUM	Iso U
THORIUM - 230	Th - 230
THORIUM - 232	Th - 232
RADIUM - 226	Ra - 226
LEAD - 210	Pb - 210
POLONIUM - 210	Po - 210
GAMMA ISOTOPIC	GaI
OTHER	SPECIFY

COLLECTED BY ______
RECORDED BY ______
DATE RECORDED ______
TOTAL NO. SAMPLES ______
EIC SITE SUPERVISOR ______
DATE SHIPPED ______

LJF - 1073 1

HEALTH PHYSICS PROCEDURES MANUAL

Procedure 3.0

Walkover Gamma Ray Scan

Approved:

_____ Date:_____

_____ Date:_____

1.0 PURPOSE

The purpose of this procedure is to describe the methodology used to identify localized contamination after remedial action and to establish boundaries of radioactive contamination.

2.0 SCOPE

This procedure includes a description of techniques and instruments used to identify areas where localized contamination may exist. It also includes a description of procedures for documentation which can be used to assess the need for a response action. Walkover gamma-ray scans are conducted as part of radiological characterization and at the completion of remedial action. For scanning purposes, a hot spot is defined as an area where the measured count rate is twice the ambient count rate (i.e. twice the response of the instrument to background).

3.0 REFERENCES

3.1 Jack Pile Project Radiation Protection Manual

3.2 Draft Jack Pile Project Environmental Monitoring Plan

4.0 EQUIPMENT AND MATERIALS

4.1 Maps and Drawings.

4.2 Grid Markers and Measuring Devices.

4.3 Portable Ratemeter/Scaler (Eberline PRS-1 or equivalent) with headphones.

4.4 Gamma Scintillation Detector (Eberline SPA-3 or equivalent)

4.5 Clipboard and Pen

5.0 PROCEDURE

5.1 On the area to be surveyed, an identification system shall be established using markers or flags to assure that areas to be scanned are marked clearly.

5.2 Determine the background count rate and source check the gamma scintillation detector/instrument. Record these readings on Form 3.1.

5.3 Grid Block Scanning

(a) Turn on the checked and calibrated instrument. Put on headphones.

(b) The detector shall be held as close to the ground surface as possible without hitting rocks or hard objects (Do not drag detector on ground).

(c) The area shall be surveyed utilizing a serpentine pattern with the detector moving perpendicular to the ground surface at the rate of six (6) to fifteen (15) inches per second. The width of the "swing" should be three (3) to four (4) feet.

(d) Use the audio response of the instrument to locate areas of above background radiation levels. Periodically observe the meter to obtain an estimate of the average levels measured.

(e) Traverse through the grid from one end to the other as many times as necessary until the entire grid is scanned. Record all scan data on the Gamma Scan Data Form (Form 3B.4).

(f) The boundary of contamination located during the survey shall be marked (flags, spray paint, or stakes and ribbon) and shall also be recorded on the survey map.

(g) Localized gamma radiation levels identified after the completion of the scan can be further investigated by collecting biased surface soil samples and by performing near-surface gamma measurements with a coneshield apparatus.

5.4 Walk-over scanning data shall be documented on the Gamma Scan Data Sheet (Form 3.2) and the survey grid drawings to identify all localized contamination.

TMA / Eberline

WEEKLY FIELD SOURCE CHECK LOG

Form 3.1

SITE NAME _____ BACKGROUND LOCATION AT _____

WEEK ENDING _____

SCALER/RATEMETER _____ SERIAL NO. _____ CALIBRATION DATE _____ DUE _____

DETECTOR _____ SERIAL NO. _____ CALIBRATION DATE _____ DUE _____

DATE / TIME	SOURCE	SERIAL NO.	ACTIVITY	SOURCE -A- CHECK, cpm	BACKGROUND cpm -B-	INSTRUMENT -C- CONV. = Eff.	SOURCE BY INSTRUMENT	H.V. AT	BAT	SPKR	DISP	OK / BY

CALCULATION OF SOURCE BY INSTRUMENT:

LMF - 1073.2

(-A-) SOURCE CHECK, cpm - BACKGROUND, cpm (-B-) = dpm OR μR/hr (-D-)

(-C-) INSTRUMENT CONVERSION, OR Eff.

NOTE: CONVERT EFFICIENCY FROM PERCENT TO DECIMAL EXAMPLE 18% TO 0.18 (EFFICIENCY CALIBRATED PROBES ONLY)

TMA / Eberline WALKOVER GAMMA SCAN DATA SHEET

Form 3.2

SITE: _____ DATE: _____ TECHNICIAN: _____

SCALER: _____ PROBE: _____ # _____ CONVERSION : _____

BACKGROUND: _____ *INDICATES MAXIMUM GAMMA RATE ON GRID KEY

X – GRID Y – GRID	GRID KEY	GAMMA RANGE	REMARKS / COORDINATES OF BIASED SOIL SAMPLES (IF TAKEN)

LJ/F – 1073.4

HEALTH PHYSICS PROCEDURES MANUAL

Procedure 4.0

Gamma-Ray Exposure Rates: One Meter Above Surface in Open Land Areas

Approved:

_____ Date:_____

_____ Date:_____

1.0 PURPOSE

The purpose of this procedure is to describe the methodology for measuring gamma-ray exposure rates at one meter above the surface in open land areas.

2.0 SCOPE

This procedure includes a description of techniques and instruments used to determine gamma-ray exposure rates, and to document the resulting radiological survey data.

3.0 REFERENCES

3.1 Jack Pile Project Radiation Protection Manual

3.2 Draft Jack Pile Project Environmental Monitoring Plan

4.0 EQUIPMENT AND MATERIAL

4.1 Maps or Drawings.

4.2 Grid Markers and Measuring Tools.

4.3 Form 3C.3, Gamma-Ray Exposure Rate Survey.

4.4 Portable Ratemeter/Scaler (Eberline PRS-1 or equivalent).

4.5 Gamma Scintillaiton Detector (Eberline SPA-3 or equivalent).

4.6 Reuter-Stokes Pressurized Ionization Chamber and Technical Manual.

4.7 Clipboard and Pen

4.8 Hewlett/Packard HP-41C Calculator (or equivalent).

5.0 PROCEDURE

5.1 Delineation of Area

(a) The area to be surveyed shall be divided into survey grid sections.

(b) Grid sections be on 200 foot centers as specified by the environmental monitoring plan.

(c) Verify the calibration status of the pressurized ionization chamber (PIC). Determine background flux rate and source check gamma scintillation detector/portable ratemeter-scaler as per instructions in procedure xx of this manual.

(d) Ensure that the detector-to-soil distance is maintained at one meter.

(e) Gamma-ray exposure rate measurements should be made at the center of each grid section for post remedial action surveys, or as defined in the characterization plan.

(f) Because of the length of time required to use the Reuter-Stokes PIC, a factor to correlate the gamma scintillation detector cpm to PIC uR/hr may be established, if numerous surveys are to be made.

(g) At 25 locations in the survey area, measurements will be made using the two instruments alternately at the same points.

(h) The counting time for the gamma scintillation detector shall be at least one-half minute. The counting time for the Rueter-Stokes PIC shall be long enough for the digital counter to register at least one micro-roentgen (uR). Refer to the Reuter Stokes PIC Technical Manual for operational instructions.

(i) A regression analysis will be performed on the data set.

(j) Once correlation has been established, all remaining gamma-ray exposure rates will be determined using the gamma scintillation detector. All cpm data will be converted to uR/hr readings.

5.2 Quality Control

(a) Take a duplicate measurement for one in every twenty (20) readings obtained with each detector.

(b) The locations for duplicate measurements will be chosen at random.

(c) Duplicate counts will be taken after all grid measurements have been made.

(d) The duplicate counts will be recorded on the same form as the original survey measurements and should be identified as duplicate readings

6.0 DOCUMENTATION

All measurements shall be recorded on Form 4.1, Gamma-Ray Exposure Rate Survey.

TMA/Eberline
GAMMA-RAY EXPOSURE RATE SURVEY

form 4.1

SITE _____ LOCATION _____

DATE _____ SURVEY NO. _____ SURVEYED BY _____

PIC

CALIBRATION FACTOR

SERIAL NO. _____ _____ mR/hr/cpm

INSTRUMENT AND DETECTOR

SCALER MODEL _____ DETECTOR MODEL _____

SERIAL NO. _____ SERIAL NO. _____

GRID POINT	µR/hr	GRID POINT	µR/hr	GRID POINT	µR/hr	GRID POINT	µR/hr

BACKGROUND OFF-SITE

_____ µR/hr

COUNT TIME

_____

LI/1073.17

Procedure 5.0

Monitoring for Radon Gas Using Alpha Particle Track Etch Devices

Approved:

_____ Date:_____

_____ Date:_____

1.0 PURPOSE

The purpose of this procedure is to describe a step by step method for measuring radon gas concentrations using alpha particle track etch devices.

2.0 SCOPE

This procedure explains how to deploy and retrieve alpha particle track etch devices. It also includes the paperwork that must be kept so that the radon concentrations can be determined by processing by device.

3.0 REFERENCES

3.1 10 CFR 20, Appendix B

3.2 Jack Pile Project Radiation Protection Manual

3.3 Jack Pile Project Draft Environmental Monitoring Plan

4.0 EQUIPMENT AND MATERIALS

4.1 Alpha particle track etch device (the Barringer, Inc. Alpha Track Detector or equivalent).

4.2 Steel fence posts, length about five feet.

4.3 Fence post driver.

4.4 One-pound coffee cans or equivalent.

4.5 Steel fencing wire, plain.

4.6 Electric drill with drill bit (about 1/4" diameter).

4.7 Pliers and wirecutters.

4.8 Map of radon monitor locations.

4.9 Low gloss spray paint, a color that blends in with the surroundings.

4.10 Silicone caulk or flexible adhesive.

5.0 SAMPLING PROCEDURE

5.1 Deployment

a. Select the radon monitoring locations, and carefully mark their locations on the site map. To reduce the likelyhood of tampering, locations should be chosen so that the monitor is below the horizon.

b. Drill 4 holes in the sides of the cans. When the can is upright, one pair of holes should placed about one inch above the bottom of the can; these holes should be horizontally spaced about one inch apart. The other pair of holes should be placed on the same side of the can about one inch from the top and should have the same spacing. Drill a few more holes about one inch from the open end of the can.

c. Spray paint the steel posts and coffee cans to reduce their visibility.

d. Remove a track etch cup from its bag. Put a dab of adhesive the size of a 25 cent piece in the center of the inside bottom of the coffee can. Mount the alpha track detector in the adhesive and allow it to cure. Be sure not to obscure the serial number of the detector or to plug up any of its vents. No more than a few hours should elapse between unsealing the alpha track detectors and deploying them.

e. Use the driver to install the fence posts at the desired locations.

f. Record the date and time that the monitor was deployed as well as its serial number and location on the site map and on Form 5.1.

g. Wire the can to the fence post with the open side facing downward.

h. Cover the open face of the can with a flexible lid, taking care to secure it with the adhesive.

5.2 Retrieving the Radon Monitor.

a. After about 90 days, remove the radon monitor and can from the fence post. Record the date and time.

b. Promptly remove the alpha track detector from the can; place it in a zip locking bag with as little air as possible. Heat seal the bag if possible.

c. Later that day, ship the alpha track monitors and Form 5.1 by overnight air freight to:

Barringer Laboratories Inc.
Radon Laboratory
5161 Ward Road
Wheat Ridge, CO 80033

6.0 QUALITY CONTROL

At one location per sampling episode, deploy two radon monitors instead of just one. This will allow the sampling and analytical error to be estimated.

BARRINGER LABORATORIES INC.

Form 5.1

15000 W 6TH AVE. SUITE 300
GOLDEN COLORADO 80401
PHONE (303, 2[illegible]-1687

5161 WARD ROAD
WHEAT RIDGE, COLORADO 80033
PHONE (303) 277-1687

TO:

Date Received: _____

Received by: _____

Approved by: _____

Client—Fill in This Section				Laboratory Use Only					
SERIAL #	CLIENT ID	DATE/TIME PLACED	DATE/TIME RESEALED	DATE/TIME COUNTED	TOTAL COUNTS BKG	1	2	NET	RADON pCi/L =

RE/SPEC Inc.
RESEARCH/SPECIALISTS
Albuquerque, New Mexico • Rapid City, South Dakota

November 27, 1989 89 NOV 28 AM 8:09

Mr. Harold V. Larkin, Jr.
Bradbury & Stamm Construction Co., Inc.
1217 First Street NW
Albuquerque, NM 87125-0027

Dear Mr. Larkin:

Per your request I have reviewed the Jackpile Project Draft Environmental Monitoring Plan, dated December, 1988, prepared by Jacobs Engineering Group, Inc. This letter summarizes the results of the review. The content of this letter is confined to the topics relevant to the initial stages of the Environmental Monitoring Program, i.e., data management procedures, groundwater, surface water, air particulates, gamma radiation, Radon-222, and meteorology. Topics which become relevant at later stages of reclamation will be addressed in a subsequent letter. These topics include vegetation, vegetative uptake of metals and radionuclides, soils, subsidence, ground vibration, and photography.

INTRODUCTION

The Draft Environmental Monitoring Plan ("the Plan") emphasizes that its purpose is to "monitor and document those components of the environment that have a reasonably high probability of being significantly impacted by the reclamation operations," as well as monitoring the components which will be used to determine that reclamation is complete. To document environmental changes resulting from reclamation, it is prudent to obtain as complete a set of high-quality "baseline" values for these environmental components as possible at the beginning of reclamation activities. There are two reasons for doing this. First, variations and trends in environmental parameters which become apparent as data are collected are more valid and defensible if the baseline information is complete and unambiguous. Second, complete baseline information obtained at the onset of reclamation can provide a comparison against which the results of environmental monitoring conducted during mining can be compared.

Because of the need for high-quality, complete baseline information, the environmental monitoring activities outlined in the Plan are based on monitoring requirements presented in the Jackpile-Paguate Uranium Mine Reclamation Project Final Environmental Impact Statement (FEIS) and the associated Record of Decision (ROD). The Plan incorporates modifications to these requirements, for the most part a reduction in the level of monitoring. This is justified, according to the Plan, since the rate of surface disturbance during reclamation is less than during mining, the technology for measurement of radionuclides is improved, and the existing database shows certain "programs" to be unnecessary. It is difficult to evaluate these changes, since data to support them are not presented in the Plan. It would have been appropriate to document in detail any departures from the requirements set out in such documents as the FEIS that were incorporated into the Plan, and provide supporting data to justify the departures. In this way the logic behind the plan would have been made clear and ambiguity would have been avoided.

Because of this lack of backup documentation, a proper evaluation of the Plan should include an examination not only of the FEIS but also of environmental data collected by the U.S. Department of Interior (DOI), Anaconda Minerals Company (AMC), and the Pueblo of Laguna (POL). Since this is not feasible in the short term, I have reviewed the Plan and made suggestions for changes to the Plan which may be implemented immediately, and which could be modified after a more thorough review of available data. This approach ensures that the quality of the data currently being collected is high, and that there will likely be few or no additions to the requirements after additional data review.

DETAILED REVIEW

Following is a section-by-section review of the Plan. If the content of the section is adequate, it is so stated. If changes are recommended, they are keyed to the appropriate section.

Section 2.0 Data Management Procedures. No comments or suggestions.

Section 3.0 Environmental Monitoring Program. Comments are made on individual sections under Section 3.0.

Section 3.1 Groundwater. Under Section 3.1.2, Requirements, it is stated that groundwater samples are to be collected annually. In the FEIS it is stipulated that samples be taken semiannually for a small suite of analytes and annually for a more comprehensive suite. For comparison, the EPA regulations specify quarterly sampling for the first year, for certain hazardous wastes. It is recommended that the sampling frequency stipulated in the FEIS be followed, i.e., semiannually for the first year, and annually thereafter, unless analytical results indicate that samples should be taken more often.

Under Section 3.1.2, Requirements, Table 3.2 lists constituents to be monitored, some during and some after reclamation. The "annual monitoring" list is not adequate for the compilation of complete baseline information. It is suggested that for the purpose of establishing a baseline the following analytes be added to the "annual monitoring" list: barium, cadmium, chromium, lead, manganese, mercury, silver, zinc, cyanide, nitrate, phosphorous, bicarbonate, carbonate, and chloride. It is further suggested that the list of analytes under "annual monitoring" in Table 3.2 is adequate for the six-month round of samples during the first year of monitoring, unless results from the baseline analyses indicate that certain additional analytes bear watching and should be added.

Under Section 3.1.2, Requirements, a reference is made to "one-time sampling" and "background," but it is not defined or described anywhere in the Plan: "If any constituent identified in the one-time sampling exceeds either 200% of the background or 50 percent of the standards contained in 10 CFR Part 20, it will be added to the annual monitoring program." It is not clear where the "one-time sampling" and "background" fit into the overall monitoring plan.

Under Section 3.1.3, Explanation, well locations are properly described as being upgradient and downgradient of the major site areas. It is not clear from this section and from the description of the geology in the FEIS that the background wells are upgradient of the pits. For example, it is stated in the FEIS that the Jackpile Sandstone dips approximately two degrees to the northwest. A well to be constructed upgradient of a particular pit to monitor background values would therefore be located southeast of the pit. However, the background well for monitoring the Jackpile Sandstone in the vicinity of the North Paguate Pit is located to the north and northwest of the pit, which is downgradient.

In order to eliminate misconceptions, it is suggested that geologic maps and cross-sections of the mine area be used to review the monitoring well locations.

Section 3.2 Surface Water. It is suggested that, for purposes of establishing baseline values, initial sampling and analysis be done for the same analytes as for groundwater monitoring, discussed above.

Section 3.3 Air Particulates. No comments or suggestions.

Section 3.4 Gamma Radiation. Under Section 3.4.4, Procedure, it is stated that a 1000-foot by 1000-foot grid will be land surveyed, and a 200-foot by 200-foot grid superimposed presumably by pacing off the distances. Because of the inaccuracies inherent in the pacing-off method, should anything happen to the stakes or the flagging it may be impossible to return to a particular grid point for resampling. It is suggested that a determination be made of the additional cost for surveying in the 200-foot grid, at least in critical or potentially critical areas, and that thought be given to surveying the smaller grid. This would facilitate verification sampling, as the sample locations would be consistent.

Section 3.5 Radon-222. Under Section 3.5.4, Procedures, it is stated that the laboratory data will be plotted each month. This should be done quarterly, as the samples are recovered quarterly.

Section 3.11 Meteorology. No comments or suggestions.

SUMMARY

The Plan is a well-conceived document and is adequate as a guidance document for environmental monitoring during reclamation of the Jackpile Mine. Suggested departures from the Plan, as well as additional data review to verify assumptions inherent in the Plan, are summarized below:

- Review data generated by DOI, AMC, and POL to document justifications for departures from the Preferred Alternative monitoring program in the FEIS
- Increase number of analytes to be monitored in groundwater and surface water
- Obtain groundwater samples semiannually during the first year of reclamation
- Review geologic data as a check on the locations of monitoring wells
- Evaluate cost impact of land surveying 200-foot grid for gamma radiation surveys

As monitoring proceeds, if the results indicate that certain elements of this Plan should be modified, discussions regarding possible changes to sampling procedures, frequencies, etc. can be held as needed.

Very truly yours,

Stephen R. Alcorn

TMA
Thermo Analytical Inc.

TMA/Eberline
5635 Jefferson Street NE
Post Office Box 3874
Albuquerque, NM 87190-3874
(505) 345-9931

90 JAN 4 AM 10

January 3, 1990

EA-0034

Mr. Hal Larson
Bradbury and Stamm, Inc.
1217 First Street NW
Albuquerque, NM 87125

Dear Mr. Larson:

During the week ending December 22, 1989 TMA/Eberline completed radiation surveys of the mine entrance area, the demolished housing area and the pit area. The surveys were carried out in accordance with Jack Pile Project Health Physics Procedure Number 4.0. In each of the areas surveyed for radiation, a 200 foot x 200 foot grid system was established. At each grid point the gamma radiation levels were measured at one meter above ground surface with a pressurized ionization chamber (PIC) and Eberline SPA-3 gamma scintillation detector. Each grid point where a gamma radiation level was measured was marked by a survey stake. These stakes had relative coordinates written on them. Jackpile Project land surveyors may still need to determine the coordinates of our radiation survey points with respect to the project's coordinate system.

Conclusions:

The average exposure rate at the mine entrance area, based on five grid point measurements is 70 micro-R per hour, which is greater than 5 times background.

The average exposure rate at the demolished housing area is well below twice background. The highest exposure rate measured at a grid point in this area was 34 micro-R per hour at S(0+200), E(0+400).

The average exposure rate in the pit area is well below twice background. The highest exposure rate measured at a grid point in this area was 38 micro-R per hour at N(0+1000), E(0+200).

Data and forms that were generated during the radiation survey have been included with this letter as attachments 1 through 9. These attachments can be described as follows:

Attachments 1, 2 & 3. These forms contain the radiation survey results. There are two entries for each grid point. The second entry is the gamma exposure rate in micro-R per hour obtained with a pressurized ionization chamber (PIC); these are the data that should be compared to twice or five times background. The first entry is the count rate in counts per minute obtained with the SPA-3 gamma scintillation detector.

Attachments 4, 5 & 6. These forms also contain radiation survey results, but I think attachments 1, 2 & 3 are more satisfactory for comparing the results to twice or five times background. There are two entries for each grid point. The first entry for each is an estimate of the exposure rate in micro-R per hour based on the SPA-3 count rate divided by a factor appropriate for radium-226 (1320 cpm per micro-R per hour). The second entry is the actual gamma exposure rate in micro-R per hour obtained with a pressurized ionization chamber. These data are provided to illustrate a pitfall of using gamma scintillation detectors to measure exposure rates. Satisfactory exposure rate data can be collected with gamma scintillation detectors provided the site specific correlation between counts per minute and micro-R per hour has been evaluated for each detector; see attachment 9.

Attachments 7 & 8. Daily background and response check data for the gamma scintillation detectors.

Attachment 9. A graph illustrating the errors that would be present in exposure rate data determined by a gamma scintillation detector if the site specific correlation of counts per minute and micro-R per hour is neglected. The solid line is for the SPA-3 gamma scintillation detector; it represents count rate versus the estimated exposure rate. The points plotted on the graph represent the SPA-3 count rate versus the actual exposure rate measured with a PIC. A site specific correlation would be obtained by performing a regression analysis on the data points.

Please feel free to call if you have any questions.

Sincerely,

Rick Haaker

Richard F. Haaker, CIH
Technical Director

RFH/h

Attachments (9)

FORM 38.2

Attachment # 1

TMA / Eberline
NEAR SURFACE GAMMA-RAY RADIATION SURVEY

SITE: Jack Pile — SURVEYED BY: Mike Bradshaw

AREA: Mine Entrance — RECORDED BY: Art Shanks

12.3 BKG = 16200 CPM — COUNT TIME: 1 MIN. — DISTRIBUTION:

_____ BKG = _____ CPM — DATE: 12-27-89 — TO: Hacker DATE: 12-27-89

TO: _____ DATE: _____

(-X) W ◄— COORDINATES —► E (+X)

(-Y) S — COORDINATES — N (+Y)

	E 1+600	E. 1+700	E 1+800							
S 0+100		164000 108.5								
S 0+200	63700 43.3	102000 64.4	109000 64.9							
S 0+300		91700 67.4								

CONVERSION FACTORS:

1320 CPM = 1 pCi/g

_____ CPM = _____ pCi/g

SCALER MODEL: ESP-1 SERIAL NO.: 1906

DETECTOR MODEL: SPA-3 SERIAL NO.: 90

SCALER MODEL: PIC SERIAL NO.: 3856

DETECTOR MODEL: _____ SERIAL NO.: _____

GROUND CONDITIONS: Dry

COMMENTS: _____

Attachment # 2

TMA / Eberline
NEAR SURFACE GAMMA-RAY RADIATION SURVEY

SITE: Jack Pile — SURVEYED BY: Mike Bradshaw

AREA: Demolished Housing Area — RECORDED BY: Art Shanks

12.3 ΣKC = 16200 mR CPM — COUNT TIME: 1 MIN. — DISTRIBUTION:

_____ ΣKG = _____ CPM — DATE: 12-21-89 — TO: Hacker DATE: 12-27-89

TO: _____ DATE: _____

(-X) W ◄— COORDINATES —► E (+X)

(-Y) S — COORDINATES — N (+Y)

East	E 0+000	E 0+200	E 0+400	E 0+600	E 0+800	E 1+000	E 1+200	E 1+400		
	—	—	—	—	—	—	—	—	—	—
N 0+200	—	—	—	14900 15.4	15600 16.2	17100 16.6	15900 15.9	17100 16.2	—	—
N 0+000	16300 15.7	12100 13.1	14900 16.4	12600 14.8	14900 15.7	13600 14.2	14100 15.6	17800 17.5	—	—
S 0+200	13600 14.4	11000 13.4	50600 34.0	12700 13.8	13200 14.8	12700 13.4	14500 15.3	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—

CONVERSION FACTORS:

1320 CPM = 1 uR/hr pCi/g _____

_____ CPM = _____ pCi/g _____

SCALER MODEL: ESP-1 SERIAL NO.: 1906

DETECTOR MODEL: SPA-3 SERIAL NO.: 90

SCALER MODEL: PIC SERIAL NO.: 3856

DETECTOR MODEL: _____ SERIAL NO.: _____

GROUND CONDITIONS: Dry

COMMENTS: _____

FORM 3B.2

Attachment # 3

TMA / Eberline
NEAR SURFACE GAMMA-RAY RADIATION SURVEY

SITE: Jack Pile — SURVEYED BY: Mike Bradshaw

AREA: PT-Pit — RECORDED BY: Art Shanks

13.3 BKG = 17,600 CPM — COUNT TIME: 1 MIN. — DISTRIBUTION:

_____ BKG = _____ CPM — DATE: 12-20-89 — TO: Hooker DATE: 12-27-89

TO: _____ DATE: _____

(-X) W ◄—— COORDINATES ——► E (+X)

(-Y)S —— COORDINATES —— N(+Y)

	00	200	400	600	800					
00	12800 14.1	13300 14.0	16900 18.2	20000 18.4	—	—	—	—	—	—
200	16500 17.0	17400 17.2	21500 20.1	14600 15.5	—	—	—	—	—	—
400	15300 16.2	25300 22.0	12800 14.3	14300 15.2	21100 18.1	—	—	—	—	—
600	12000 13.9	13200 14.8	12100 14.7	21800 19.8	17100 15.5	—	—	—	—	—
800	25700 19.9	14700 15.8	22600 20.7	49200 34.8	20900 18.4	—	—	—	—	—
1000	—	49700 37.9	37800 30.1	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—

CONVERSION FACTORS:

1320 CPM = 1 μR/hr pCi/g _____

_____ CPM = _____ pCi/g _____

SCALER MODEL: ESP-1 SERIAL NO.: 1906

DETECTOR MODEL: SPA-3 SERIAL NO.: 90

SCALER MODEL: PIC SERIAL NO.: 3854

DETECTOR MODEL: _____ SERIAL NO.: _____

GROUND CONDITIONS: Dry

COMMENTS: _____

FORM 3B.2

TMA / Eberline

Attachment # 4

NEAR SURFACE GAMMA-RAY RADIATION SURVEY

SITE: Jack Pile SURVEYED BY: M. Ka Bradshaw

AREA: Mine Entrance RECORDED BY: Art Shanks

12.3 BKG = 14200 CPM COUNT TIME: 1 MIN. DISTRIBUTION:

_____ BKG = _____ CPM DATE: 12-21-89 TO: Hooker DATE: 12-22-89

TO: _____ DATE: _____

(-X) W ◄— COORDINATES —► E (+X)

N (+Y) — COORDINATES — S (-Y)	E 1+600	E 1+700	E 1+800							
S 0+100	—	124.2 109.5	—	—	—	—	—	—	—	—
S 0+200	48.3 43.3	77.3 69.4	82.6 64.9	—	—	—	—	—	—	—
S 0+300	—	69.5 67.4	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—

CONVERSION FACTORS:

1320 CPM = 1uR/hr pCi/g = _____

_____ CPM = _____ pCi/g _____

SCALER MODEL: ESP-1 SERIAL NO.: 1904

DETECTOR MODEL: SPA-3 SERIAL NO.: 90

SCALER MODEL: PIC SERIAL NO.: 3854

DETECTOR MODEL: _____ SERIAL NO.: _____

GROUND CONDITIONS: Dry

COMMENTS: _____

FORM 38.2

TMA / Eberline

Attachment # 5

NEAR SURFACE GAMMA-RAY RADIATION SURVEY

SITE Jack Pile SURVEYED BY: Mike Bradshaw

AREA: Demolished housing area RECORDED BY: Art Shanks

12.3 BKG = 14200 CPM COUNT TIME 1 MIN. DISTRIBUTION:

_____ BKG = _____ CPM DATE: 12-21-89 TO: Hooker DATE: 12-27-89

TO: _____ DATE: _____

(-X) W ◄—— COORDINATES ——► E (+X)

(-Y)S —— COORDINATES —— N(+Y)

	E 0+000	E 0+200	E 0+400	E 0+600	E 0+800	E 1+000	E 1+200	E 1+400		
	—	—	—	—	—	—	—	—	—	—
N 0+200	—	—	—	11.3 15.4	11.8 14.2	13.0 16.6	12.0 15.9	13.0 14.2	—	—
N 0+000	12.3 15.7	9.2 13.1	11.3 14.4	9.5 14.8	11.3 15.7	10.3 14.2	10.7 15.6	13.5 17.5	—	—
S 0+200	10.3 14.4	8.3 13.4	38.3 34.0	9.6 13.8	10.0 14.8	9.6 13.4	10.1 15.3	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—

CONVERSION FACTORS:

1320 CPM = 1pCi/hr pCi/g

_____ CPM = _____ pCi/g

SCALER MODEL: ESP-1 SERIAL NO.: 1906

DETECTOR MODEL: SPA-3 SERIAL NO.: 90

SCALER MODEL: DIC SERIAL NO.: 3856

DETECTOR MODEL: _____ SERIAL NO.: _____

GROUND CONDITIONS: Dry

COMMENTS: _____

Attachment # 6

TMA / Eberline
NEAR SURFACE GAMMA-RAY RADIATION SURVEY

SITE Sauk Pit SURVEYED BY: Mike Bradshaw

AREA: PT - PIT RECORDED BY: Art Shanks

13.3 BKG = 17600 CPM COUNT TIME 1 MIN. DISTRIBUTION:

_____ BKG = _____ CPM DATE: 12-20-89 TO: Hacker DATE: 12-27-89

TO: _____ DATE: _____

(-X) W ← COORDINATES → E (+X)

(-Y) S ← COORDINATES → N (+Y)

	00	200	400	600	800					
00	9.7 14.1	10.0 14.0	12.8 18.2	15.1 18.4						
200	12.5 17.0	13.2 17.2	16.3 20.1	11.1 15.5						
400	15.6 16.2	19.2 22.0	9.7 14.3	10.8 15.2	16.0 18.1					
600	9.1 13.9	10.0 14.8	9.2 14.7	16.5 19.8	13.0 15.5					
800	19.5 19.9	11.1 15.8	17.1 20.7	37.3 34.3	15.8 18.4					
1000		37.7 37.9	28.6 30.1							

CONVERSION FACTORS:

1320 CPM = 1 pCi/hr pCi/g

_____ CPM = _____ pCi/g

SCALER MODEL: ESP-1 SERIAL NO.: 1906

DETECTOR MODEL: SPA-3 SERIAL NO.: 90

SCALER MODEL: PIC SERIAL NO.: 3856

DETECTOR MODEL: _____ SERIAL NO.: _____

GROUND CONDITIONS: Dry

COMMENTS: See Back for Drawing

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TMA / Eberline

FORM SE-2

WEEKLY FIELD SOURCE CHECK LOG

SITE NAME Jack Pile Reclaimation BACKGROUND LOCATION AT B+S Office

WEEK ENDING 12/24/89

SCALER/RATEMETER ESP-1 SERIAL NO. 1906 CALIBRATION DATE 10/25/89 DUE 4/25/89

DETECTOR SPA-3 SERIAL NO. EAC# 90 CALIBRATION DATE 9/29/89 DUE 3/29/89

DATE / TIME	SOURCE	SERIAL NO.	ACTIVITY	SOURCE -A- CHECK, cpm	BACKGROUND cpm -B-	INSTRUMENT -C- CONV. - Ei	SOURCE BY INSTRUMENT	H.V. AT	BAT	SPKR	DISP	OK BY
12/24/89 10:00	Cs-137	A-1	8 μCi	1,620,000	17600 cpm			1000	OK	OK	OK	OK A.S.
12/21/89 9:45	Cs-137	A-1	8 μCi	1,520,000	16200 cpm			1000	OK	OK	OK	OK A.S.

CALCULATION OF SOURCE BY INSTRUMENT:

LMF - 1073.2

(-A-) SOURCE CHECK, cpm - BACKGROUND, cpm (-B-) = dpm OR μR/hr (-D-)

(-C-) INSTRUMENT CONVERSION, OR Ei

NOTE: CONVERT EFFICIENCY FROM PERCENT TO DECIMAL EXAMPLE 18% TO 0.18 (EFFICIENCY CALIBRATED PROBES ONLY)

REMARKS:

Attachment # 7

TMA / Eberline

FORM SE-

WEEKLY FIELD SOURCE CHECK LOG

SITE NAME Jack Pile Reclamation Project BACKGROUND LOCATION AT BHS offices

WEEK ENDING 12-24-99

SCALER/RATEMETER ESP-1 SERIAL NO. 2005 CALIBRATION DATE 12-19-99 DUE 6-19-00

DETECTOR SPA-3 SERIAL NO. 30 CALIBRATION DATE 10-24-99 DUE 4-24-00

DATE / TIME	SOURCE	SERIAL NO.	ACTIVITY	SOURCE -A- CHECK, cpm	BACKGROUND cpm -B-	INSTRUMENT -C- CONV. = Eff.	SOURCE BY INSTRUMENT	H.V. AT	BAT	SPKR	DISP	OK BY
12-20 10:00	Cs-137	A-1	8 µCi	1620000	18800			900	ok	ok	ok	ok MD
12-21 09:00	Cs-137	A-1	8 µCi	1650000	19400			900	OK	OK	OK	ok MP

CALCULATION OF SOURCE BY INSTRUMENT: LMF - 1073.2

(-A-) SOURCE CHECK, cpm - BACKGROUND, cpm (-B-) = dpm OR µR/hr (-D-)

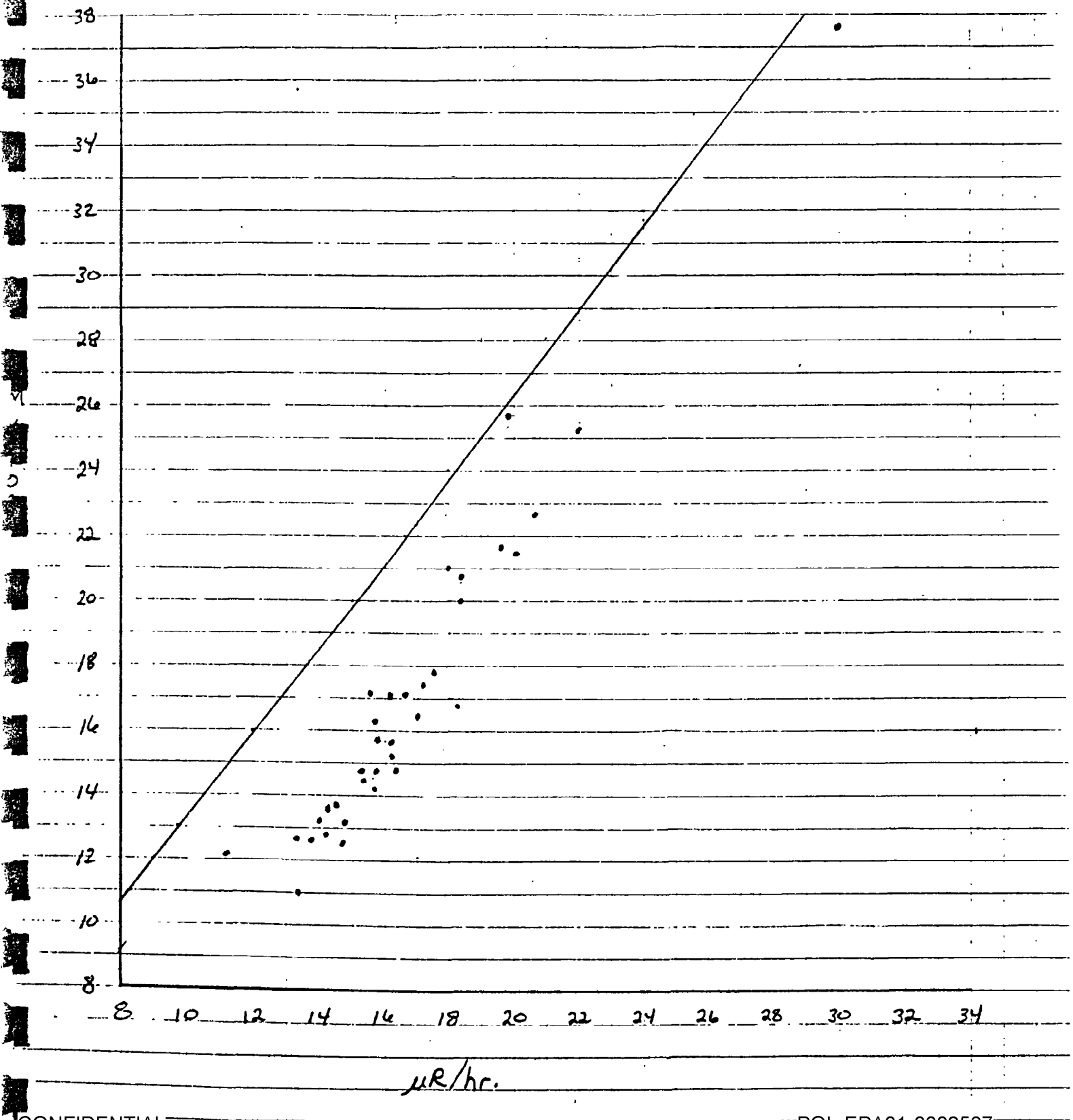
(-C-) INSTRUMENT CONVERSION, OR Eff.

NOTE: CONVERT EFFICIENCY FROM PERCENT TO DECIMAL EXAMPLE 18% TO 0.18 (EFFICIENCY CALIBRATED PROBES ONLY)

REMARKS:

Attachment # 8

Attachment 9



2. CRITICAL FOLLOW UP ITEMS

2.1 POL Actions or Decisions

* Approve Health Physics procedures

* Provide release of liability to ICMC for work not completed as of December 31, 1989.

2.2 BIA Actions or Decisions

* Coordinate BLM review of Rio Moquino relocation.

2.3 Laguna Construction Actions or Decisions

* Prepare variance report.

* Provide updates to project schedule.

* Request close out of completed work packages.

2.4 ICMC Actions or Decisions

* Furnish weather station.

* Furnish water sampling analysis.

* Return RGM-2's when Eberline finishes recalibrating them.

DECEMBER BILLINGS

MOBILIZATION AND INTERIM WORK PACKAGES

NUMBER	DESCRIPTION	ESTIMATED COSTS	PRIOR BILLINGS	12/15/89 BILLING	12/31/89 BILLING	TOTAL COST TO DATE	TOTAL COST REMANING
2M1L05	Purchase small tools	$63,724	$44,287.29	$7,438.76	$699.21	$52,425.26	$11,298.74
2M1L06	Remodel Project Offices	$46,520	$50,103.85	$442.53		$50,546.38	($4,026.38)
2M1L07	Recondition Job Site	$97,163	$63,606.97	$10,034.07	$11,588.87	$85,229.91	$11,933.09
2M1L08	Set Up Shop Facilities	$192,210	$177,367.66	$10,753.30	$1,447.50	$189,568.46	$2,641.54
2S2N01	Dewater north Paguate Pit	$141,666	$201,470.17	$2,234.68	$890.10	$204,594.95	($62,928.95)
2S3S01	Demolish North Paguate Structures	$2,947	$579.06	$0.00		$579.06	$2,367.94
2S3N01	Demolish South Paguate Structures	$57,896	$32,169.43	$40.01	$0.00	$32,209.44	$25,686.56
2S1S05	Plug Drill Holes	$27,196	$65.02	$605.08	$3,142.52	$3,812.62	$23,383.38
2M3L01	Operator Training	$14,600	$182.86	$747.74	$28,291.58	$29,222.18	($14,622.18)
2E1N01	Construct NP Haul Roads	$60,352	$18,642.61	$268.21	$11,398.33	$30,309.15	$30,042.85
2M2N01	Land Surveying NP Area	$18,800	$555.54			$555.54	$18,244.46
2S1N01	Seal PW-2/3 Underground Entry	$317	$0.00			$0.00	$317.00
2S1S03	Seal H-1 Adit	$10,902	$0.00	$476.07		$476.07	$10,425.93
2S1S04	Seal Vent Holes	$56,640	$2,336.13	$7,205.20	$367.77	$9,909.10	$46,730.90
2E1N11	Relocate NP-PS-13 to NP Pit	$148,952	$0.00	$15,380.74	$58,258.59	$73,639.33	$75,312.67
2E2N05	Cut NP-WO-06 Slopes	$23,741	$0.00			$0.00	$23,741.00
2E1N12	Cut Slopes NP-OP-19	$148,393	$5,905.02	$35,790.61	$6,067.01	$47,762.64	$100,630.36
2E4S01	Demolition SP-SS 27,28,31,33	$162,633	$7,734.86	$5,528.08		$13,262.94	$149,370.06
2E1S01	Build South Paguate Haul Roads	$87,899	$0.00	$89.44	$6,479.53	$6,568.97	$81,330.03
1L1L02	Insurance	$145,500	$92,920.00	$7,093.00		$100,013.00	$45,487.00
1L1L01	G & A	$119,100	$89,400.00	$35,000.00	$35,000.00	$159,400.00	($40,300.00)
2E1N07	SP-PS-01 TO NORTH PIT	$1,488,353			$35,552.09	$35,552.09	$1,452,800.91
	LCC Administrative costs	$176,000	$176,000.00			$176,000.00	$0.00
	TOTAL TARGET PRICE	$3,291,504	$963,326.47	$139,127.52	$199,183.10	$1,301,637.09	$1,989,866.91
	CONSTRUCTION MANAGEMENT CONTRACTOR	$121,730	$93,735.00		$20,540.00	$114,275.00	$7,455.00
	CMC Purchases		$4,517.31		$875.04	$5,392.35	($5,392.35)
	Environmental	$184,943	$46,927.61		$14,088.30	$61,015.91	$123,927.09
	TOTAL ALL COSTS	$3,598,177	$1,108,506.39	$139,127.52	$234,686.44	$1,482,320.35	$2,115,856.65

JACKPILE PROJECT
INTERM CONSTRUCTION MANAGEMENT CONTRACT
APPLICATION FOR PAYMENT

INVOICE # 221
APPLICATION # 5
PERIOD: 12/1/89 TO 12/31/89

ITEM	DESCRIPTION	ORIGINAL ESTIMATE	PREVIOUS BILLINGS	THIS BILLING			TOTAL TO DATE
				QUANITY	UNIT PRICE	TOTAL	
1	Inspector	$46,000	$34,400	120	$50	$6,000	$40,400
2	Construction engineer	$33,600	$17,160	20	$60	$1,200	$18,360
3	Construction Manager	$17,960	$24,880	99	$80	$7,920	$32,800
4	Secretary	$7,360	$5,620	136	$20	$2,720	$8,340
5	Travel	$11,100	$7,800	6	$300	$1,800	$9,600
6	Per Diem	$2,300	$1,800	3	$100	$300	$2,100
7	Office Supplies	$575	$450	4	$25	$100	$550
8	Office Trailer	$2,875	$1,625	4	$125	$500	$2,125
9	Subtotal	$121,730	$93,735			$20,540	$114,275
10	Purchased Items		$4,517	$833.37	5% mark-up	$875.04	$5,392
11	Environmental	$184,943	$46,928	$13,417.43	5% mark-up	$14,088.30	$61,016
12	Total		$145,180	$14,250.80		$35,503.34	$180,684

WORK PACKAGE DISCUSSION

2M1L01 - Purchase small tools:
This package is substantially complete. It includes all of the tools for the shop and the computer for the accounting department of LCC. There will be a few small charges remaining in January. There will be an under run in this package.

2M1L06 - Remodel Project Offices:
This package is complete. It had an over run of $4,046.38. Due to the unknown condition of the existing buildings, LCC should be commended for doing this work as close to the budget as they did.

2M1L07 - Recondition Jobsite:
This package is complete and had an under run of $11,933.09. However there may be a few small charges left to come in.

2M1L08 - Set up shop facilities:
This package is complete. There may still be a few small charges left to come in. At this time there is an under run in this package.

2S2N01 - Dewater North Paguate Pit:
At this time this package shows an overrun of $60,000. This is due to the fact that Jacobs' estimate had the equipment and pipe for dewatering split into three packages, North Paguate pit, South Paguate pit, and Jackpile pit. In fact it was necessary to buy all of the pipe and two out of three pumps in order to start dewatering the North Paguate pit. In the first year operating plan the other two dewatering packages have been authorized. LCC can now charge the pipe and equipment to those packages and credit this package.

2S3S01 - Demolish North Paguate surface structures:
This package is complete and has an underrun of $2,368.

2S3N01 - Demolish South Paguate surface structures:
This package is temporarily complete. There are still some structures at the P-10 area which are awaiting a decision from POL as to whether they want to use the buildings. After those buildings are resolved there will be an under run in this package.

2S1S05 - Plug drill holes:
There is no work to be done in this package. The ICMC inspector has gone over the entire are where the drill holes were and did not find a single one that is open.

WORK PACKAGE DISCUSSION cont.

2M3L01 - Operator training:
This package was increased substantially in the first year operating plan. The training will commence in December 1989.

2E1N01 - Build North Paguate Haul Roads:
This is on ongoing package and will last until the North Paguate is complete.

2M2N01 - Surveying North Paguate Area:
This is on ongoing package and will last until the North Paguate is complete.

2S1N01 - Seal PW-2/3 Underground Entry:
This package is complete. It was done in conjunction with 2E1N12.

2S1S03 - Seal H-1 Adit:
This package is complete and there is an underrun in it.

2S1S04 - Seal vent holes:
This package is complete except for one hole in the Jackpile area. We expect a substantial underrun in this area.

2E1N11 - Relocate NP-PS-13 to NP pit:
This package has been started and should be finished in January. The cost estimate should be very close to the actual cost.

2E2N05 - Cut NP-WO-06 Slopes:
This package has been started and should be finished in January. The cost estimate should be very close to the actual cost.

2E1N12 - Cut Slopes NP-OP-19:
This package is complete. There was a substantial underrunn in this area.

2E4S01 - Demolition SP-SS 27,28,31,33:
This work package is primarily removing contaminated soils from the roadways in the South Paguate. This work will be done in the first operating year in conjunction with the backfilling of the South Paguate pit.

2E1S01 - Build South Paguate Haul roads:
This will be an on going work package in the first operating year.

WORK PACKAGE DISCUSSION cont.

1L1L02 - Insurance:
This is primarily insurance for the equipment and buildings. There is a $50,000 carry over into the first operating year.

1L1L01 - G&A:
There was a carry over of $29,700 into the first operating year. This added to the authorization for the first operating year will provide $70,000 per month for the overhead operations of LCC.

1C1L01 - Environmental Monitoring:
This package will continue through the first operating year.

1C1L04 - ICMC
This package is substantially complete. There will be some costs associated with turning the project over to the new CMC. This package is $7,455 under budget at this time.

JACKPILE MINE - LAGUNA NEW MEXICO
JOBSITE WEEKLY PROJECT MEETING
December 6, 1989
JIM OLSEN, PUEBLO OF LAGUNA
ROGER BAER, BUREAU OF INDIAN AFFAIRS
NEAL KASPER, LAGUNA CONSTRUCTION COMPAN
NORM SHAIN, BRADBURY & STAMM CONSTRUCTI
PAUL SIERRA, BRADBURY & STAMM CONSTRUCT
HAL LARKIN, BRADBURY & STAMM CONSTRUCTI
ALICE FORTENBURY, BRADBURY & STAMM CONS

1) Jim Olsen, POL brought up that Eberline needed the Old Housing, Adit H-1 and the West Pit NP-OP-19.

2) Jim also mentioned there is a guard shack that be surveyed because the LCC wanted to use it.

3) Eberline is writing Field Test Procedures since procedures were not provided by Jacob's Engineering.

4) LCC four week schedule was the same as the Nove 1989 schedule.

5) Jim Olsen, POL will check on CMC check for Octc billing which was never received.

6) LCC's November 30, 1989 pay estimate was approv given to Jim Olsen, POL for payment.

7) CMC's November pay estimate was submitted to Ji POL for approval and payment.

8) CMC had four lead lined boxes made for the radi badges and will be located:

a) Guard Shack @ Staging Area
b) Field Office
c) Shop Office
e) LCC's Office

9) Before any radiation badges are handed out forn be filled out for each employee.

10) Monday, December 11, 1989 CMC will have the we re-drill Well #8 that collapsed and have it tested.

11) On the Annual Operating Plan the POL requested that the

a) G & A and Margin broke out in the summary.
b) Break out the Work Packages for 1990
c) List the Mobilization Work Packages that would extend into 1990
d) Operator Training new work package for 1990 add G & A and Fee
e) Use word substitution instead of optional

UNLESS WRITTEN MODIFICATION IS SUBMITTED WITHIN SEVEN (7) DAYS, THE ABOVE REPORT SHALL BE DEEMED CORRECT AND SO FILED.

THE NEXT MEETING WILL BE HELD @ 9:00 AM WEDNESDAY, DECEMBER 13TH.

Very truly yours,
BRADBURY & STAMM CONSTRUCTION CO., INC.

Alice Fortenbury
Project Technician

cc: Jim King

JACKPILE MINE - LAGUNA NEW MEXICO
JOBSITE WEEKLY PROJECT MEETING
December 13, 1989
JIM OLSEN, PUEBLO OF LAGUNA
ROGER BAER, BUREAU OF INDIAN AFFAIRS
NEAL KASPER, LAGUNA CONSTRUCTION COMPANY
HAL LARKIN, BRADBURY & STAMM CONSTRUCTION
ALICE FORTENBURY, BRADBURY & STAMM CONSTRUCTION

1) Jim Olsen, POL and on behalf of the Pueblo thanked Bradbury &.Stamm for their input on the Mobilization Work and would be glad to give us a recommendation if we need one.

2) The new CMC representative, Jim Harrison, Landmark Reclamation out of Denver will be at Laguna Monday, December 18, 1989.

3) Jim Olsen mentioned that Witt Kasnip, Westcon who went joint venture with Landmark Reclamation will need to get with someone on the scheduling program.

4) LCC turned in their four week schedule showing the following Work Packages complete:

2M1L06 Remodel Project Offices,
2M1L07 Recondition Jobsite - Except Gravel Area Around Offices
2M1108 Set Up Shop Facilities
2S3N01 Demolition-NP Structures
2S3S01 Demolition-SP Structures
2S1N01 Seal PW-2/3 U/G Entry
2E1N12 Cut Slopes NP-OP-19

5) CMC will be sending Punch List to LCC for the completed Work Packages.

6) CMC did bring up that LCC needed to band the surplus sheetmetal so it would not be blowing all over the site.

7) LCC will be taking out the partition walls out of the old offices at the P-10 Area so Laguna Industries could see the open space that is available in the building if they decide to buy the buildings and move them off the site.

8) BIA has no actions at this time.

9) Bradbury & Stamm inquired about their October Pay Estimate check that had not been received to date. Jim Olsen, POL was to check with Wilfred Herrera. The November Pay Estimate is also due.

10) CMC will make radiation badges presentation at the Operator's Training Program Thursday, December 14, 1989.

11) Well #8 that had collapsed was redrilled Monday, December 11, 1989.

12) CMC handed out Health Physics Procedure Manuals from Eberline for review and comments to be back to the CMC by Wednesday, December 20, 1989.

13) Eberline is overhauling, cleaning and recalibrating the two RGM-2 that were brought from the jobsite.

14) CMC will be setting up surveys done by Eberline on the NP-OP-19, Guard Shack and Housing Area for Monday or Tuesday of next week.

15) Eberline is contracted with Bradbury & Stamm (CMC) so this will have to be worked out with the new CMC and POL.

16) The jobsite will be closed down Friday at noon, December 22, 1989 through Tuesday, January 2, 1990.

17) LCC needs to get December 30th billing to the CMC on Thursday, December 28th or sooner for processing.

18) The final meeting for Bradbury & Stamm will be Thursday, December 28th @ 1:00 p.m. at the Ranchers. At that time necessary paperwork will be turned over to the POL and LCC.

UNLESS WRITTEN MODIFICATION IS SUBMITTED WITHIN SEVEN (7) DAYS, THE ABOVE REPORT SHALL BE DEEMED CORRECT AND SO FILED.

Very truly yours,
BRADBURY & STAMM CONSTRUCTION CO., INC.

Alice Fortenbury
Project Technician

cc: Jim King

5. CONSTRUCTION PHOTOGRAPHS

Pushing NP-PS-13 into the North Pit

Belly Dump Training